MULTIMEDIA UNIVERSITY

STUDENT IDENTIFICATION NO

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FINAL EXAMINATION

TRIMESTER 1, 2016/2017

BKC3034 – BUSINESS SYSTEMS ANALYSIS AND DESIGN

(All Sections / Groups)

18 OCTOBER 2016
2:30 p.m. – 4:30 p.m.
(2 Hours)

INSTRUCTION TO STUDENTS

1. This paper consists of 5 pages with **TWO** sections only.
2. Answer **ALL** questions in Section A, and **THREE (3)** out of **FOUR (4)** questions in Section B. The distribution of the marks for each question is given.
3. Please write all your answers in the answer script provided.

SECTION A: CASE STUDY

Answer ALL questions.

HudsonBanc Billing System Upgrade

Two regional banks with similar geographic territories merged to form HudsonBanc. Both banks had credit card operations and operated billing systems that had been internally developed and upgraded over three decades. The systems performed similar functions, and both operated primarily in batch mode on mainframe computers. Merging the two billing systems was identified as a high-priority cost-saving measure.

HudsonBanc initiated a project to investigate how to merge the two billing systems. Upgrading either system was quickly ruled out because the existing technology was considered old and the costs of upgrading the system were estimated to be too high. HudsonBanc decided that a new component-based, Web-oriented system should be purchased. Management preferred the purchase option because it was assumed that a purchased system could be brought online more quickly and cheaply. An RFP (request for proposal) was prepared, many responses were received, and after months of business modeling and requirements activities, a vendor was chosen.

Hardware for the new system was installed in early January. Software was installed the following week, and a random sample of 10 percent of the customer accounts was copied to the new system. The new system was operated in parallel with the old systems for two months. To save costs involved with complete duplication, the new system computed but didn't actually print billing statements. Payments were entered into both systems and used to update parallel customer account databases. Duplicate account records were checked manually to ensure that they were the same.

After the second test billing cycle, the new system was declared ready for operation. All customer accounts were migrated to the new system in mid-April. The old systems were turned off on May 1, and the new system took over operation. Problems occurred almost immediately. The system was unable to handle the greatly increased volume of transactions. Data entry and customer Web access slowed to a crawl, and payments were soon backed up by several weeks. The system wasn't handling certain types of transactions correctly (e.g., charge corrections and credits for overpayment). Manual inspection of the recently migrated account records showed errors in approximately 50,000 accounts.

It took almost six weeks to adjust the incorrect accounts and update functions to handle all transaction types correctly. On June 20, the company attempted to print billing statements for the 50,000 corrected customer accounts. The system refused to print any information for transactions more than 30 days old. A panicked consultation with the vendor concluded that fixing the 30-day restriction would require more than a month of work and testing. It was also concluded that manual entry of account adjustments followed by billing within 30 days was the fastest and least risky way to solve the immediate problem.

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Clearing the backlog took two months. During that time, many incorrect bills were mailed. Customer support telephone lines were continually overloaded. Twenty-five people were reassigned from other operational areas, and additional phone lines were added to provide sufficient customer support capacity. System development personnel were reassigned to IS operations for up to three months to assist in clearing the billing backlog. Federal and state regulatory authorities stepped in to investigate the problems. HudsonBanc agreed to allow customers to spread payments for late bills over three months without interest charges. Setting up the payment arrangements further aggravated the backlog and staffing problems.

Source: From J. Satzinger, R. Jackson, & S. Burd, *Systems Analysis & Design in a Changing World*, 6th ed., 2012.

QUESTION 1

a. What are the problems that HudsonBanc is facing with its new system?

(5 marks)

b. The new system was obtained through purchasing. Briefly describe **TWO (2)** other alternatives in obtaining the new system.

(6 marks)

c. What type of installation did HudsonBanc use for its new system? Was it an appropriate choice? Justify your answers.

(10 marks)

d. How could the operational problems have been avoided? Provide **FOUR (4)** possible solutions.

(4 marks)

(Total: 25 marks)

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SECTION B: ESSAYS

Answer THREE (3) out of FOUR(4) questions.

QUESTION 2

a. One of the approaches to software construction and modelling is the structured approach. Define the term "structured design" in this context. Briefly describe the **TWO (2)** principles of structured design.

(8 marks)

b. Briefly describe the steps that are needed to develop a detailed work schedule.

(9 marks)

c. Develop an **activity diagram** based on the following narrative:

> The subject registration in college X is done online if the students registered within the given time period. After this period, students would need to do the manual registration at the faculty's front desk. The online system requires that a student enters his/her student ID and password for authentication. Upon authentication, the student enters the subject code. The system returns the results showing available time slots for the chosen subject. The student then selects the preferred time slot. If this is done within the allocated registration date, the system registers the student and display the confirmed time table. The student then proceeds to logout. If the attempted registration is done after the time period, the student would need to fill up a form and proceed with the manual registration.

(8 marks)

(Total: 25 marks)

QUESTION 3

a. Describe **TWO (2)** techniques for identifying use cases. Which is the most comprehensive approach?

(8 marks)

b. What are **TWO (2)** advantages and **TWO (2)** disadvantages of building a system from the ground up?

(8 marks)

c. Briefly describe **THREE (3)** major types of Web applications. (9 marks)

(Total: 25 marks)

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QUESTION 4

a. Read the narrative below for a customer billing process:

> At the end of month, purchasing department sent notification to the chief billing manager so he can generate the invoices. Once the notification is received, the chief billing manager enters an authorisation code into the computer, allowing the invoice generation program to be run. The program requires data from the billing jobs file, which is stored on a magnetic disk. A confirmation and billing job number is displayed on the screen, with this written down on a 'billing run record' form by the manager. Once the code is entered the manager places the billing run record form in his locked desk drawer and leaves the computer to create customer invoices overnight.
>
> In preparing the invoices the computer scans the open invoices file for details of any invoices that were issued to a customer over the previous month. It also searches the cash receipts data for all cash receipts received from customers, as well as the refunds and credits granted file for any other items that may impact on the customer's owing balance. The customer master data is also accessed for the opening account balance and any discount terms that the customer may be entitled to. This data is then used to prepare an invoice for each customer who had a transaction of any sort during the preceding month. The new balance owing is transferred to the customer master data. The invoices are then printed out and the computer displays a summary of the invoices generated.
>
> The next morning, when the manager arrives in their office, they retrieve the 'billing run record' form and record the details of the batch on the form. The invoices and the record form are then forwarded to the billing assistant, who reconciles the number of invoices to the total on the record form before sending the invoices to the customer. The billing run record form, with the completed batch details for the month's invoices, is sent to the accounts manager.

(i) Develop a logical context data flow diagram (DFD) for the above system.

(4 marks)

(ii) Develop a logical level-0 for the above system. Ensure that it is consistent with the context diagram developed in part (i).

(15 marks)

b. Explain **TWO (2)** types of integrity controls for input forms.

(6 marks)

(Total: 25 marks)

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QUESTION 5

a. Draw a **system flowchart** based on the narrative given below:

The SS Company is a magazine distributor that maintains a file of magazine subscribers for creating monthly mailing labels. Magazine subscribers mail change-of-address forms or new-subscription forms directly to the company, where input personnel key the information into the system through online terminals. The computer system temporarily stores this information as file of address-change or new subscription requests. Clerical staff keys these data into computer files continuously, so we may characterize it as "daily processing".

Once a week, the system uses the information in the daily processing file to update the subscriber master file. At this time, new subscriber names and addresses are added to the file, and the addresses of existing subscribers who have moved are changed. The system also prepares a Master File Maintenance Processing Report to indicate what additions and modifications were made to the file.

(7 marks)

b. What is the difference between *cloud computing* and *virtual servers*?

(8 marks)

c. Define the terms *alpha version*, *beta version*, and *production version*. Are there well-defined criteria for deciding when an alpha version becomes a beta version or a beta version becomes a production version?

(10 marks)

(Total: 25 marks)

End of paper